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THE BASIS OF REASONABLE RAILWAY RATES.

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The questions whether it is possible to determine the cost per unit of transportation to the carrier, and whether this cost, if it could be determined, is of any particular value in fixing reasonable rates, have often been discussed. The conclusions most frequently arrived at in these discussions seem to be that the cost of transportation, say, one hundred pounds of freight for any given distance, cannot be computed and that, even if it could be, it would not be of a great deal of assistance in making freight rates. These conclusions, however, do not seem to be entirely convincing. While it may be impossible to find the exact cost of each particular shipment, it appears to be possible to determine this cost per unit closely enough for most practical purposes. Likewise, it also appears that the cost is, perhaps, the most important element that should be taken into consideration in fixing rates. In order to show these facts it will be necessary to describe briefly some of the methods under which, in our work on the Wisconsin Commission, we have found it possible to compute the approximate cost per unit of transportation, and also to touch upon certain other matters to illustrate the importance of this cost to the rate-maker.

The first step in computing the cost consists in separating the expenses between the different branches of the service. The freight traffic, for instance, should bear its fair share of the total cost and this is true also for the

passenger traffic. A large proportion of the expense items can be actually separated, but there are also many items that are common to all branches of the traffic and that have to be assigned upon bases that are more or less arbitrary in their character. The fact that they may be arbitrary, however, does not necessarily mean that they are merely estimates or that they may not be fair. It is usually found that most of the common items bear a close relation to some particular unit of operation or traffic. Some depend on either the car, the locomotive, or the train mile. Others again depend on the number of cars handled, the number of tons, and the number of tons carried one mile. There are also common or indirect items which bear a very close relation to some of the direct expenses and can safely be allotted in the same proportion. When the various expense items are taken to pieces, reclassified, and in various ways put through the laboratory process, it is usually found that they can be allocated and placed about where they naturally belong. It is upon processes of this character that nearly all systems of cost accounting are based. There are to-day many industrial and commercial enterprises with more branches of production and with a larger proportion of common expense items than common carriers, where cost keeping has been so highly developed as to furnish the bases upon which the prices of their products are fixed. The difficulties that have had to be overcome in many of these cases were even more complicated than those which obtain in the railroad service. What has been accomplished in these industries may also be accomplished for common carriers. If these carriers would go to the trouble of keeping exact records, their common expense items would be materially reduced. It is true that this might involve more detailed records than many now in

use, and that it might also tend to increase the operating expenses. But the value of this work to the rate maker, particularly to Commissions, would be extremely great. The field certainly offers enough promises of usefulness, so that it ought at least not to be left unoccupied simply because it happens to involve some trouble and perhaps some additional expense.

When the total expense of the freight traffic has thus been determined, the next step consists in separating the same on the basis on which the traffic is handled, or between the cost of handling it at the terminals and the cost of moving it between these terminals. In this case, as in the case of assigning the expenses among the different branches of the traffic, many items are encountered which are common to both sides and which do not readily admit of exact distribution. But even these difficulties may be overcome. Upon a close and detailed examination of the nature of the various items, it will be found that in this case also the common expenses may be fairly and equitably distributed.

With these separations made, the problem is how to compute the cost per gross and net ton, the cwt., or other unit. This can be done best through the medium of the loaded car. This must necessarily be so since freight is ordinarily handled and moved in carload lots, some of which weigh a great deal more than others. When the terminal expenses are pro-rated upon the number of loaded cars, we obtain the average cost of these expenses to each loaded car. When the cost per car, in turn, is pro-rated upon the gross weight, or on the weight of both car and the load, we obtain the cost per gross ton. The figures thus obtained furnish a basis upon which the cost per unit of the terminal expenses may be determined for light as well as for heavy loads. When the movement ex-

penses per loaded car per mile are pro-rated upon the total weight of both the car and the load, we obtain the cost per gross ton per mile of haul. These figures in turn constitute the basis upon which the net cost per unit per mile for moving the freight between stations under all sorts of loading may be determined.

Under these methods it is thus possible to find the cost per unit for handling the freight at the terminals, as well as for each mile of the haul. These two items make up the cost of transportation. The former, or the terminal cost, is a constant quantity. It is not affected by the distance, but remains the same for short as for long hauls. The movement expenses, on the other hand, vary with the length of the haul. They are also relatively greater for way-freight or local traffic than for through traffic.

The final steps consist in adjusting the movement expenses between the way freight and the through haul. As has been said, the former is, as a rule, the more costly. Way freight trains stop and unload and take on freight at practically every station on their run, and therefore make much less mileage in the same time than through trains. In fact the latter usually make more than twice as much mileage in a given time as the former. Slower time in this case stands for relatively higher costs for wages, fuel, and other items. While these excesses in the cost for some of the items are to some extent offset by lower cost for certain other items, those offset are not great enough to place the two classes of hauls on an equal basis. In addition to this the through trains often carry heavier loads, which also tends to reduce the relative cost. Investigation has revealed that the movement expenses per unit are often from two to three times as great for way-freight as for through-freight.

The methods which have thus been pointed out are often very complicated. In fact they are mostly of such character as to require almost all sorts of laborious calculations. For purposes of illustration, the cost per unit for one of the leading roads in this state, as obtained under these methods, has been tabulated, and this table may be examined. It conveys a fairly good idea of what has been said. The figures contained in it constitute some of the more important material for the construction of a rate schedule.

The charges which a railroad may make for the services it performs are limited by its obligations to the public and by the principles which govern its business. It is generally held that it has the right to adopt a schedule of rates that will produce sufficient revenue to meet its operating expenses, including a fair return upon the value of its property. A schedule which will meet these requirements is regarded as reasonable when considered as a whole. The lowest rate would perhaps be that, which, besides meeting the operating cost, would contribute at least something towards the interest upon the investment. The highest rate in it, on the other hand, may be several times as great as the lowest rate. Much, in this respect, depends upon the policy of the roads or of those who fix the rates.

In determining what is a reasonable rate, therefore, it is also necessary to know the value of the property used for the purposes of transportation as well as what constitutes a fair rate of interest upon this valuation. These are important questions and have frequently been passed upon by the courts. While no definite rules have been laid down for fixing either the valuation or the rate, the courts have pointed out the various factors which should be taken into account in determining both.

But a rate schedule to be fair and just should not only yield the required amount in revenue, but each particular rate in it should bear a proper relation to all the other rates. That is, the charge on each article or shipment should cover the cost of transportation and contribute its just proportion of the interest on the investment. This proportion in turn depends upon the cost of transportation and on the value of the service or of the articles shipped.

The value of the service, in the sense it is used here, is the same as the value of the articles shipped, and is another element that should be taken into account in adjusting rates. Articles of high value can afford to pay higher rates than articles of low value. In other words, value is a measure of the ability to pay. Cheap and bulky articles can be obtained for transportation only at low rates. They have not the ability to pay high charges. This is particularly true when the distance is great. For articles of high value in proportion to bulk the situation is different. In this case the rates, even if high as compared to those for low priced goods, constitute so small a part of the total value as to be of comparatively small importance. Since high priced goods can afford to pay more than low priced goods it is to the best interests of both the public and the carriers that their rates should be higher. Low grade and bulky articles should perhaps be charged rates that are sufficient to meet operating expenses and yield something above this for interest on the investment. Such traffic is of importance even on these terms. It increases the volume of the business and therefore decreases the cost per unit. By contributing something towards the profits of the carrier it also reduces the amount that will have to be so contributed by the other classes of the traffic. Arti-

cles of medium value and bulk should be charged the average rates. Articles of high value and small bulk should be charged rates that are high enough to meet operating costs, including interest on the valuation, and which besides will make up for any deficiencies in capital requirements that may have arisen because of the low rates at which the low grade traffic had to be accepted.

Except for the commodity tariffs, which come in a class by themselves, the consideration that is given to value in fixing rates is usually determined by the freight classification. Articles of high value are ordinarily placed in classes which take higher rates than articles of lower value. This is the general rule, although there may be some exceptions to it in cases where other factors such as risk, weight, bulk, etc., play an important part. Classification is in fact largely based upon the value of the articles which are included in it. It is a part of the rate schedules. The principles which govern in classifying the goods are the same as those which control the making of rates.

It is in passing upon facts of this character that the cost per unit of transportation becomes an important matter. This cost is of material assistance in determining the general rate level of the schedule as a whole, or the amount to be earned under it. It is also necessary in order to determine what is a fair rate for each class of articles. In fact it is difficult to see how either an entire schedule or any particular rate can be fair which has been fixed without any reference to the cost of the services involved. This cost is also of the greatest importance in the classification of the freight, for as computed here it discloses the effect of both weight and bulk upon the cost of the services. For articles of great bulk in proportion to their weight the cost of loading

per car is usually light and of transportation relatively high. For articles of small bulk in proportion to the weight the reverse is true. Another fact which tends to increase the value of such cost figures is that the various factors of transportation remain fairly constant from one year to another. The cost per unit, for instance, for the various roads which enter this state has remained about the same for the past five years. The situation is also in most cases such that due consideration can be given to the cost without excluding any of the other elements that should be taken into account. In view of all this it would seem that cost easily occupies the first place among all the factors which must be considered in rate making. The cost per unit of transportation modified by the value of the articles transported or their ability to pay charges constitutes the basis upon which most of the rates may safely be based. For purposes of further illustration a tariff schedule has been made up in which both the cost and the value of the services has been taken into account, and which under present conditions will yield about ten per cent. as interest on the cost of reproducing the road to which it applies.

The discussion which followed was very informal. The chief points brought out were as follows: (1) There is no such great difference in the cost of transportation on different roads as one might expect. This refers to roads in Wisconsin. (2) Cost varies in different years, yet these variations have not been great during the past fifteen years. (3) Rate-making on a basis of cost requires that the state commission should separate intra-state from interstate traffic, and while to some extent arbitrary, this can be done closely enough for practical

purposes. Traffic in Wisconsin costs less than the traffic on the whole lines of roads doing business in Wisconsin. (4) Intra-state and interstate is a distinction different from "local and through traffic". (5) Terminal expenses do not cause particular difficulty. They are distributed over the traffic which benefits by the use of the terminal. (6) The commission has not omitted to consider empty car mileage in its determination of cost. This is especially prominent in the live-stock traffic. (7) Rate-making on a basis of cost permits of increases as well as decreases in rates due to changes in wages and cost of materials. (8) The commission has not made cost an invariable basis. This has been used as a guide, while the departures up or down in the case of any commodity may be made on considerations of value of the commodity or other tests of expediency. While this procedure admits the failure of cost as a sole and invariable basis in every charge, it is vastly different from making rates on consideration of expediency alone without reference to cost. With cost as a basis you have a norm to be departed from in cases where this may be clearly justified, in individual cases, but your rates as a system will still be based on cost. (9) This system of rate-making requires that distance be not ignored as a factor, but group rates and tapering rates have been used.

Professor Meyer explained a number of statistical charts prepared by the commission for its own use showing the systematic arrangement of rates after the commission had adjusted them.